Regaining the Square of Opposition in Formal Ontology Development

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[1] Afshar,M. and Dartnell, Ch. and Luzeaux, D. and Sallantin, J. and Tognetti,Y., Aristotle's Square Revisited to Frame Discovery Science, *Journal of Computers,* 2 (2007), pp.54-66

[2] Murinová, P. and Novák, V., A Formal Theory of Generalized Intermediate Syllogisms. *Fuzzy Sets and Systems,* 186 (2013), pp.47-80

[3] Murinová, P. and Novák, V., Analysis of generalized square of opposition with intermediate quantifiers. *Fuzzy Sets and Systems,* (accepted)

[4] Peterson, P.L., *Intermediate Quantifiers. Logic, linguistics, and Aristotelian semantics*, Aldershot, Ashgate, 2000.

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Regaining the Square of Opposition in Formal Ontology Development

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Use of formal ontologies is becoming widespread in information systems. Forerunners of formal ontologies are scientific classification systems such as the Linnaean biological ones. Unlike biological classifications modern formal ontologies are often non-hierarchical.

A formal ontology in its basic form simply specifies all direct inclusion relationships between a finite repertoire of classes. Individuals may be conceived of as singleton classes. An assertion "P sub Q" states that class P is an immediate subclass of Q. These given relationships are often rendered as directed graphs. The subclass relationship induces a partial order relation corresponding to the relationship "all P are Q" in the square of opposition.

Accordingly, so far, formal ontologies provide only assertions of the form "all P are Q". However, it is our contention that the three other assertion forms in the square of opposition come about implicitly by appropriate, often tacitly assumed default conventions as to be explained. Assume existential import so that all classes are considered non-empty, implying that there is no empty null class.

Defaults:

1) Overlapping (i.e. non-disjoint) classes, viz. "some P are Q", has at least one common subclass.

2) Dually, classes are disjoint ("no P is Q") if they do not have a common subclass.

3) The assertion form "some P are not Q" is -- analogously to class overlap -- achieved by requiring that there be a subclass of P which is disjoint with Q. More radically this assertion may be held simply in the case that "all P are Q" does not hold.

These default rules are routinely adopted in ontology development without mentioning. Appealing to these conventions, the 4 sentence forms in the square are effectively made at disposal. We discuss a first order metalogical formalization of the 4 sentence forms with classes reified as individual constants elucidating the logical relationships between the sentence forms.

Our formalization appeals to non-provability. Non-provability incurs non-monotonicity, implying that extension of an ontology with additional subclass relationships may call for

retraction of derived square of opposition relationships. This reflects the crucial distinction between the closed world assumption (CWA) and the open world assumption (OWA).

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The diplomatic virtual presence in the light of the semiotic square

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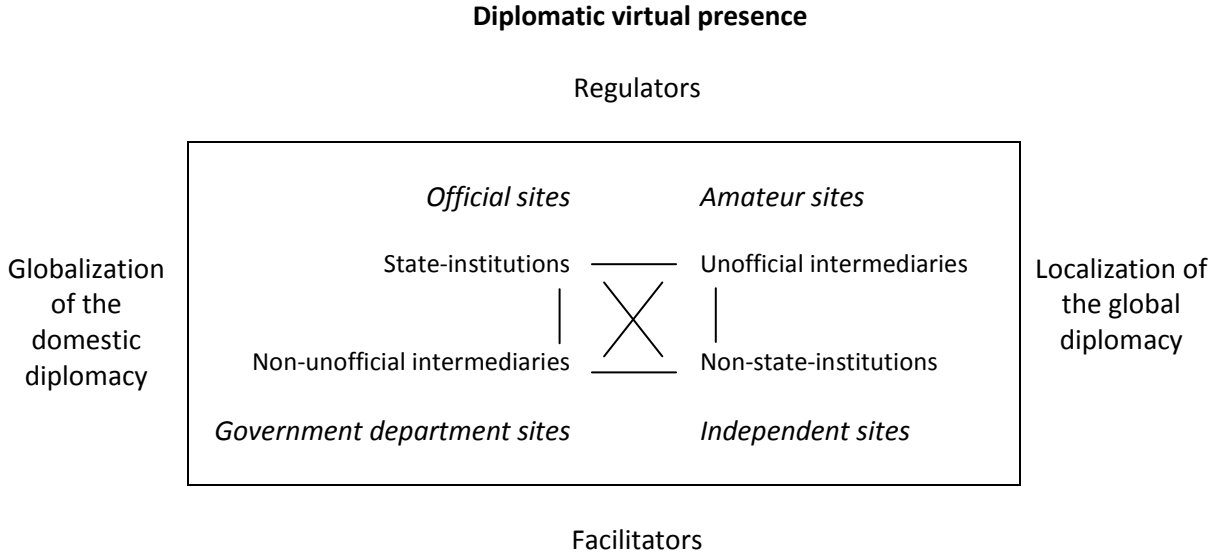
New technologies have led many local and national governments across the world to invest in new ways to approach and to engage citizens as well as to increase transparency and accountability. Those transformations have also had an impact on the diplomatic affaires, where embassies try to respond both to digital diplomacy and e-government initiatives.
This paper contains an overview of the diplomatic virtual presence by focusing on the conceptual and practical contributions of the semiotic square. From the semiotic analysis perspective, the semiotic square is a tool used to map logical relations of a semantic category. Therefore, the case study that is conducted here not only demonstrates the applicability of the semiotic square to map the meanings that are invested on the embassies websites but also, the complexity of the conceptual and the visual representation that emerges from hierarchizing the basic four –terms of the structure, what allows setting out the superior levels of the online diplomatic use, misuse and non-use.



Bibliography

A. J. Greimas et J. Courtés*, Sémiotique — Dictionnaire raisonné de la théorie du langage, Hachette, Paris, 1993 (1979).*

C. Villar, *Le discours diplomatique,* L'Harmattan, Paris, 2006

H. J. Scholl, ed*, E-Government: Information, Technology, and Transformation, Ad*vances in Management Information Systems, Armonk, New York, 2010

K. Hamilton, R. Langhorne, *The* Practice *of Diplomacy: Its Evolution, Theory, and Administration,* Routledge, New York2011 (1995)